45. The protein crystal of any one of claims **30-44**, wherein the first polynucleotide is attached to the first protein via a surface amino group of the first protein.

46. The protein crystal of any one of claims **30-45**, wherein the second polynucleotide is attached to the second protein via a surface amino group of the second protein.

47. The protein crystal of claim **45** or claim **46**, wherein the surface amino group is from a Lys residue.

48. The protein crystal of any one of claims **45-47**, wherein the first polynucleotide is attached to the first protein via a triazole linkage formed from reaction of (a) an azide moiety attached to the surface amino group and (b) an alkyne functional group on the first polynucleotide.

49. The protein crystal of any one of claims **45-48**, wherein the second polynucleotide is attached to the second protein via a triazole linkage formed from reaction of (a) an azide moiety attached to the surface amino group and (b) an alkyne functional group on the second polynucleotide.

50. The protein crystal of any one of claims **30-49**, wherein the first polynucleotide is attached to the first protein via a surface carboxyl group of the first protein.

51. The protein crystal of any one of claims **30-50**, wherein the second polynucleotide is attached to the second protein via a surface carboxyl group of the second protein.

52. The protein crystal of any one of claims **30-51**, wherein the first polynucleotide is attached to the first protein via a surface thiol group of the first protein.

53. The protein crystal of any one of claims **30-52**, wherein the second polynucleotide is attached to the second protein via a surface thiol group of the second protein.

54. The protein crystal of any one of claims **30-53**, wherein the protein crystal exhibits catalytic, signaling, therapeutic, or transport activity.

55. The protein crystal of any one of claims **30-54**, wherein the first protein and/or the second protein is a protein fragment.

56. The protein crystal of any one of claims **30-55**, further comprising a third conjugate comprising a third protein and a third polynucleotide, wherein the third polynucleotide is sufficiently complementary to the first polynucleotide or the second polynucleotide to hybridize.

57. The protein crystal of any one of claims **30-56**, wherein the protein crystal has a pore size of from about 1 nanometer (nm) to about 100 nm in diameter.

58. A method of catalyzing a reaction comprising contacting one or more reagents for the reaction with the protein crystal of any one of claims **30-57**, wherein contact between the reagents and the protein crystal results in the reaction being catalyzed to form a product of the reaction.

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